

### **3. Tools for Enhancing Credit and Lowering Costs**

#### **Introduction**

Environmental protection needs and expectations are continuing to grow, while the resources available to meet those needs and expectations are increasingly constrained at all levels of government. Federal, state and local governments and the private sector are exploring the use of more efficient, effective, and innovative solutions to help address these major challenges. They are aggressively looking for and creating ways and opportunities to lower environmental costs, increase environmental investment, and build environmental capacity by creating partnerships with state and local governments and the private sector to fund environmental needs.

Federal, state, and local governments and the private sector are also looking for ways to enhance their credit so they can make their financial resources go further. Credit enhancement serves as an assurance to lenders and bondholders that credit is available, and that they will be repaid if the debtor government or private party should default or delay payment. Small businesses and local governments with poor credit ratings or no credit ratings may be able to gain access to capital markets and loan funds through credit enhancements, thus increasing the equity of access and allowing environmental projects to move forward.

This section presents and evaluates a number of the important mechanisms that these governments are testing and using to lower costs, enhance and build credit, increase investment, and build capacity through partnerships. It also looks at these mechanisms in terms of their contributions to financing environmental protection needs on a sustainable basis. The mechanisms reviewed in the section vary widely, ranging from specific analytical financial management tools to common-sense financial practices to broad, sweeping, innovative government programs and initiatives.

Some of the tools and initiatives discussed, such as refinancing and financial capability analysis, have been used for years. Others, such as cost-benefit analyses, cost-effectiveness analysis, and full-cost pricing are not new, but their use in the environmental arena may be new or growing. Still others, such as risk management and comparative risk ranking, have been used by one environmental media or by one level of government, and their use is now being incorporated in new areas or by new parties. One thing that these tools all have in common is that they represent approaches for lowering costs or enhancing credit, and for helping to address the long-term needs for financing environmental protection initiatives that are facing the nation.

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## **Pooled Financing Programs**

**Description:** Pooling is the act of uniting, or an agreement to unite, an aggregation of properties belonging to different individuals, with a view to common liabilities or profits. Financing mechanisms such as loans and bonds are often pooled in arrangements called pooled financing programs or credit pools. Pooled financing programs can be used to lower interest rates, lower issuance costs, and increase flexibility for loans, bonds, and other financing mechanisms. Through credit pools, local government agencies and other organizations can take advantage of economies of scale by sharing the costs of issuing bonds or other debt instruments and securing lower interest rates. Regional credit pools are often used to finance local capital infrastructure projects such as water, sewer, and road improvements. The Florida Municipal Power Agency's Pooled Loan Project finances various electric, gas, water, sewer, and other utility related projects. The Association of Bay Area Governments (ABAG) in the San Francisco Bay Area manages 46 credit pools that have funded over 131 projects totaling more than \$319 million. ABAG's credit pools have been used to fund a variety of projects, including construction and renovation of municipal and public safety buildings, and water, sewer, and drain projects.

**Reference for Further Information:** Florida Municipal Power Agency Website:

[http://fmpa.com/html/member\\_services/pooled\\_loan.html](http://fmpa.com/html/member_services/pooled_loan.html).

Association of Bay Area Governments Website:

<http://www.abag.ca.gov/services/finance/pooling/summary.htm>.

Answers.com: <http://www.answers.com/topic/pooling?cat=biz-fin>.

## **U.S. Small Business Administration: Surety Bond Guarantees**

**Description:** The U.S. Small Business Administration (SBA) guarantees surety bonds for contracts up to \$2 million, covering bid, performance, and payment bonds for small and emerging contractors who cannot obtain surety bonds through customary commercial channels. A surety bond guarantee is an agreement between a surety and the SBA. Surety bond guarantees provide that the SBA will assume a predetermined percentage of loss in the event that the contractor should breach the terms of the contract. The SBA's guarantees give sureties an incentive to provide bonding for eligible contractors, improving the contractors' chances of obtaining bonding. Contractors must qualify as small businesses based on the SBA's criteria and meet the surety's bonding qualifications to be potentially eligible for SBA surety bond guarantees. Professional agents or brokers specializing in providing surety bonds and the U.S. Department of Treasury, Financial Management Service, can provide information regarding specific sureties. Most large property and casualty insurance companies have surety departments.

**Reference for Further Information:** U.S. Small Business Administration (SBA) Website:

[http://www.sba.gov/services/financialassistance/basics/sbarole/surebond\\_geninfo.html](http://www.sba.gov/services/financialassistance/basics/sbarole/surebond_geninfo.html). See "Surety Bonds" in Section 10b of this Guidebook and "Performance Bonds" in this Section of the Guidebook. Wikipedia: [http://en.wikipedia.org/wiki/Surety\\_bond](http://en.wikipedia.org/wiki/Surety_bond).

U.S. Department of the Treasury Website: <http://www.fms.treas.gov/c570/c570.html>.

## **Bond Insurance**

**Description:** Bond insurance is a legal commitment by an insurance company to make payments of principal and interest on debt in the event that the bond issuer is unable to make those payments on time. Bond insurance is usually paid at the time of issue as a percentage of the bond amount, and it may be used for any bond including general obligation and revenue bonds. The function of bond insurance in the market is threefold: 1.) to reduce interest costs to issuers, 2.) to provide a high level of security to investors, and 3.) to furnish improved secondary-market liquidity and price support. In general, the use of bond insurance will lower annual carrying costs, once premiums are paid, since the use of this insurance generally results in higher bond ratings which lead to lower annual interest rates. Bond insurance allows many small communities and public and private water systems to receive investment grade ratings and thus improve their chances of qualifying for bonds and loans. States use bond insurance for private activity tax-exempt bonds, particularly for environmentally “risky” solid waste-type facilities. Private activity bonds are used to fund facilities for the furnishing of water and sewage, solid waste disposal facilities, and qualified educational facilities.

**Reference for Further Information:** Temel, Judy W.; *The Fundamentals of Municipal Bonds*, 5<sup>th</sup> ed.; John Wiley & Sons, Inc.; 2001, pp. 13-15, available at <http://www.amazon.com>. National Association of Insurance Commissioners portal to state insurance commissioner Websites: [http://www.naic.org/state\\_web\\_map.htm](http://www.naic.org/state_web_map.htm). See “Private Activity Bonds” in Guidebook Section 2a. InvestinginBonds.com: <http://www.investinginbonds.com/learnmore.asp?catid=8&subcatid=55&id=111>.

### State Bond Banks

**Description:** State bond banks are public authorities created to help communities, especially smaller ones without substantial financial expertise or credit history, to access the reduced loan rates and other efficiencies of the tax-exempt bond market. By pooling smaller bond issues and providing state credit backing, state bond banks cut the cost of borrowing for communities. The Maine Municipal Bond Bank and the Virginia Resources Authority are examples of state bond banks. Bond banks are used to finance public facilities including wastewater and drinking water treatment systems and solid waste processing facilities. Bond banks provide three main economic advantages to localities: 1.) economies of scale in bond issuance, resulting from the elimination of duplication of fixed issuance costs, negotiated underwriting, administrative cost savings, and the use of specialized techniques to further reduce interest costs such as variable rates or zero coupon bonds, 2.) a pool of credit is generally perceived as more creditworthy than an individual credit because default risk is diversified, and 3.) improvements in credit quality via enhancement devices such as moral obligation pledges and revenue intercept mechanisms.

**Reference for Further Information:** Council of Development Finance Agencies Website: <http://www.cdfa.net/cdfa/cdfaweb.nsf/pages/statebondbanksanderson.html>. Maine Municipal Bond Bank Website: <http://www.mainebondbank.com/>. Virginia Resources Authority Website: <http://www.virginiaresources.org/>.

### State Loan and Bond Guarantees

**Description:** Loan and bond guarantees are a form of credit assistance offered by states to recipients including counties, localities, and businesses. State guarantees are a very effective form of leveraging that can considerably reduce the costs of borrowing for bond issuers and loan recipients. Minnesota is an example of a state with a bond guarantee program. Minnesota's program reduces county borrowing costs on general obligation bonds by providing limited state guarantees of the payments on those bonds, thus allowing counties to receive higher bond ratings. Through the program, counties in Minnesota are provided with guarantees on general obligation bonds issued for the construction of solid waste facilities and other types of facilities specified by the state. An example of a state loan guarantee program is the Oregon Credit Enhancement Fund. This fund has guaranteed over 118 loans totaling over \$27 million since 1994. The average credit enhancement loan awarded through this fund is for \$230,000. Businesses and facilities meeting specific criteria are eligible for loan guarantees through the Credit Enhancement Fund. Any business that uses loan proceeds to clean up a brownfield site is eligible.

**Reference for Further Information:** Minnesota Department of Employment and Economic Development Website: <http://www.deed.state.mn.us/programs/pfacountycred.htm>. State of Oregon Economic and Community Development Corporation Website: <http://www.econ.state.or.us/cef.htm>. See "General Obligation Bonds" in Section 2a of this Guidebook.

### **Performance Bonds**

**Description:** Performance bonds are surety bonds issued by insurance companies on behalf of contractors, such as construction companies, to protect clients from the potential consequences of the contractors' failure to complete contracts in accord with plans and specifications. Performance bonds are frequently issued to secure the contractors' promises on the many public construction projects, such as wastewater treatment plant construction projects, that are performed by private sector firms in the United States. These bonds indicate that a financially responsible party, such as a commercial bank or insurance company termed the "surety," stands behind the contractor. Performance bonds permit the surety, upon contractor default, to either pay the bond penalty, or finance or hire a new contractor. Performance bonds are often required by the owners of the land to be developed or facility to be built. By furnishing these bonds, contractors may obtain credit, such as construction loans, at lower rates. These bonds limit surety liabilities to set amounts specified in bond agreements and contracts. Performance bonds can help environmental protection initiatives such as brownfields redevelopment projects which might otherwise be viewed as too risky or complex to move forward on a timely basis.

**Reference for Further Information:** Surety Information Office Website: [http://www.sio.org/html/why\\_bonds\\_reqd.html](http://www.sio.org/html/why_bonds_reqd.html). Wikipedia: [http://en.wikipedia.org/wiki/Performance\\_bond](http://en.wikipedia.org/wiki/Performance_bond) and [http://en.wikipedia.org/wiki/Bond\\_%28finance%29](http://en.wikipedia.org/wiki/Bond_%28finance%29). See Section 2a of this Guidebook for general information about bonds.

### **Letters of Credit**

**Description:** Letters of credit (LCs) are documents that increase the basic security behind bonds and loans. LCs are generally issued by commercial banks and are used for two purposes: to enhance credit and enhance liquidity. A letter of credit represents a contract between the issuing bank and the bond trustee. In LCs issued for credit enhancement purposes, the issuing bank irrevocably agrees to provide funds to meet debt service payments in the event that the bond issuer or loan recipient is unable to do so; and the LCs specify that funds will be used only for bond or loan repayment. In LCs designed for liquidity enhancement, the issuing bank provides liquidity enhancement by agreeing to advance any funds necessary to purchase bonds tendered by investors. LCs are used to increase market access for issuers who may have difficulty selling their bonds due to perceived weaknesses in their ability to meet their obligations. It is important that the bank issuing the LC has a sound financial history, a diverse loan portfolio, and adequate assets. Communities or companies that are ineligible for other types of credit enhancements could use LCs. LCs may be utilized to enhance the security behind bonds or loans used to finance environmental protection projects such as the construction of drinking water treatment plants or recycling facilities.

**Reference for Further Information:** See “Lines of Credit” in this section of the Guidebook. Wikipedia: [http://en.wikipedia.org/wiki/Letter\\_of\\_credit](http://en.wikipedia.org/wiki/Letter_of_credit). Temel, Judy W.; *The Fundamentals of Municipal Bonds*, 5<sup>th</sup> ed.; John Wiley & Sons, Inc.; 2001, pp. 190-191, available at <http://www.amazon.com>.

### Lines of Credit

**Description:** A Line of Credit (LOC) is an arrangement between a bank or other financial institution and a customer that establishes a maximum loan balance that the financial institution will permit the borrower to maintain. LOCs are different from standard loans in that borrowers do not pay interest on the parts of their lines of credit that they do not use. Like letters of credit, lines of credit enhance the basic security behind debt instruments including bonds and loans. This is because the customer can access the LOC in times of financial hardship if needed to make payments on bonds and loans. The critical difference between letters of credit and lines of credit is that with lines of credit there are conditions under which the provider would not have advance funds under a draw. These conditions could potentially include default on the borrower’s other debts, bankruptcy of the borrower, or a rating change, to name only a few. The analyst has to look at each individual line of credit to assess the degree of credit enhancement it provides. LOCs could be used by communities or companies that are ineligible for other types of credit enhancements. Lines of credit could potentially be utilized to enhance the security behind bonds used to finance environmental protection initiatives such as wastewater treatment plant construction.

**Reference for Further Information:** See “Letters of Credit” in this section of the Guidebook. Temel, Judy W.; *The Fundamentals of Municipal Bonds*, 5<sup>th</sup> ed.; John Wiley & Sons, Inc.; 2001, pp. 190-191, available at <http://www.amazon.com>. The Free Dictionary Website: <http://financial-dictionary.thefreedictionary.com/Line+of+Credit+-+LOC>.

### Senior and Subordinated Debt Structuring

**Description:** Senior and subordinated debt structuring, also called subordinated debt, provides for two categories of debt for the loan recipient. The debt in the “senior” category is required to be repaid first should default or payment delays occur. The debt in the “subordinate” category is required to be repaid only after the senior debt, or lenders, are paid. This type of debt structuring is a credit enhancement for the senior debt or lender. Gladstone Capital is an example of a finance company that invests in senior subordinated loans. Subordinated debt structuring is used as a credit enhancement in State Revolving Fund (SRF) bond leveraged lending. For example, the New York State Environmental Facilities Corporation uses a senior subordinated debt structure for its Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF) revenue bonds. The Environmental Facilities Corporation uses the proceeds of offered bonds that are subordinated to senior bonds issued in its Master Financing Indenture (MFI) pooled financing program to finance or refinance water pollution control and drinking water projects.

**Reference for Further Information:** New York State Environmental Facilities Corporation Website: <http://www.nysefc.org/docs/2006c.pdf>. Gladstone Capital Website: [http://www.gladstonecapital.com/profile\\_seniorsubdebt.htm](http://www.gladstonecapital.com/profile_seniorsubdebt.htm). See “State Revolving Fund (SRF) Revenue Bonds” in Section 2a of this Guidebook. U.S. Environmental Protection Agency Website: <http://www.epa.gov/owm/cwfinance/cwsrf/index.htm> & <http://www.epa.gov/safewater/dwsrf/index.html>.

### **State Revolving Fund (SRF) Interest Rate Subsidies**

**Description:** Interest rate subsidies on loans are a form of credit enhancement that is provided under the Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF) loan programs. Under federal statutes, states administering CWSRF and DWSRF loan programs are authorized to set specific loan terms, including interest rates, from zero percent to market rate, and repayment periods of up to twenty years. Interest rate subsidies on loans are, in effect, a credit enhancement for borrowers. This is because the subsidies reduce the cost of the loans, and thus increase the likelihood of loan applications being approved by increasing the perceived likelihood of repayment. These interest rate subsidies reduce the costs of environmental infrastructure for communities. The Texas Water Development Board is an example of an entity that offers interest rate subsidies on its CWSRF and DWSRF loans.

**Reference for Further Information:** See “U.S. Environmental Protection Agency: Clean Water State Revolving Fund,” and “U.S. Environmental Protection Agency: Drinking Water State Revolving Fund” in Section 2a of this Guidebook. U.S. Environmental Protection Agency Website: <http://www.epa.gov/owm/cwfinance/cwsrf/basics.htm> & <http://www.epa.gov/safewater/dwsrf/frequentquestions.html#3>. Texas Water Development Board Website: [http://www.twdb.state.tx.us/assistance/financial/fin\\_infrastructure/cwsrffund.asp](http://www.twdb.state.tx.us/assistance/financial/fin_infrastructure/cwsrffund.asp) & [http://www.twdb.state.tx.us/assistance/financial/fin\\_infrastructure/dwsrf.asp](http://www.twdb.state.tx.us/assistance/financial/fin_infrastructure/dwsrf.asp).

### **State Revolving Fund (SRF) Cross-Collateralization**

**Description:** Cross-collateralization between the Clean Water State Revolving Fund (CWSRF) and the Drinking Water State Revolving Fund (DWSRF) was authorized by the Departments of Veteran’s Affairs and Housing and Urban Development under the Independent Agencies Appropriations Act (Public Law 105-276) in 1999. The Act authorizes funds from one SRF program to be used to secure the other SRF program against default. This allows a DWSRF to benefit from existing CWSRF credit quality, diversification, and coverage levels, or vice versa. The U.S. Environmental Protection Agency (EPA) announced its policy on transfer and cross-collateralization of SRFs in the Federal Register on October 13, 2000. EPA emphasizes in the Federal Register notice that cross-collateralization can assist states in increasing the availability of SRF funds where they are most needed, enhancing bond ratings, and lowering borrowing costs without increasing risks. Through cross-collateralization, states may combine, or pool, assets of the CWSRF and the DWSRF programs and use them as security for bond issues. New Jersey is an example of a state that has received approval for a cross-collateralization structure and has issued bonds with the structure in effect.

**Reference for Further Information:** U.S. Environmental Protection Agency (EPA) Website: <http://www.epa.gov/owm/cwfinance/cwsrf/innovations.htm>, <http://www.epa.gov/safewater/dwsrf/index.html> and <http://www.epa.gov/fedrgstr/EPA-WATER/2000/October/Day-13/w26353.htm>. See “U.S. EPA Clean Water State Revolving Fund” and “U.S. EPA Drinking Water State Revolving Fund” in Guidebook Section 2b.

### **Accelerated Depreciation**

**Description:** The accounting term “depreciation” describes any method of attributing the historical purchase cost of an asset across its useful life, roughly corresponding to the normal wear and tear of the asset. Accelerated depreciation is defined as any one of several methods by which a company, for “financial accounting” and/or tax purposes, depreciates a fixed asset in such a way that the amount of depreciation taken each year is higher during the earlier years of the asset’s life. For financial accounting purposes, accelerated depreciation is frequently used with assets that are expected to be most productive during their early years, so that depreciation amounts will more accurately reflect how much the usefulness of the assets is being reduced each year. Through the use of accelerated depreciation, corporations can defer their income taxes by reducing taxable income in current years, in exchange for increased taxable income in future years. Accelerated depreciation allows for faster tax write-offs than straight line depreciation. Businesses could use accelerated depreciation to reduce their income tax liabilities by depreciating assets used for environmental protection such as pollution cleanup equipment.

**Reference for Further Information:** Consult a tax practitioner.  
Internal Revenue Service Website: <http://www.irs.gov/publications/p946/index.html>.  
Wikipedia: [http://en.wikipedia.org/wiki/Accelerated\\_depreciation](http://en.wikipedia.org/wiki/Accelerated_depreciation) & <http://en.wikipedia.org/wiki/Depreciation>.  
Investorwords.com: [http://www.investorwords.com/35/Accelerated\\_Depreciation.html](http://www.investorwords.com/35/Accelerated_Depreciation.html).

### **Activity-Based Costing**

**Description:** Activity-based costing (ABC), a cost accounting methodology, is a method of allocating costs to products and services. It is generally used as a tool for planning. The use of ABC supports activity-based management that portrays an organization as a series of activities related to customer desires and costs. In ABC, functional costs, direct and indirect, are assigned to an organization's activities and those activities are traced to related products or services. Strategic management accounting based on the ABC methodology supports a long-term approach to decision making. In ABC, engineering process improvement is considered as a source of cost reduction. There are commercially available computer software packages for employing ABC on mainframes, networks, and personal computers. ABC is commonly used in cost accounting analyses, especially in the private sector. Information generated through the use of ABC gives visibility to how effectively resources are being used and how all relevant activities contribute to the costs of a product or service. Such information may help with decisions about whether to restructure or privatize environmental protection related activities.

**Reference for Further Information:** Wikipedia: [http://en.wikipedia.org/wiki/Activity-based\\_costing](http://en.wikipedia.org/wiki/Activity-based_costing). SAS Institute Website: <http://www.sas.com/solutions/abm/>. Infogoal.com: <http://www.infogoal.com/category.php?n=19>. Valuebased management.net: [http://www.valuebasedmanagement.net/methods\\_abc.html](http://www.valuebasedmanagement.net/methods_abc.html). Accounting Software Research Website: <http://www.asaresearch.com/articles/abc.htm>.

**U.S. Department of Housing and Urban Development  
Community Development Block Grant Program:  
Section 108 Loan Guarantees**

**Description:** Section 108 is the loan guarantee provision of the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant (CDBG) program. Section 108 provides communities with financing for economic development, housing rehabilitation, public facilities, and large-scale physical development projects. All projects and activities funded through Section 108 are required to either principally benefit low and moderate income persons, aid in the elimination or prevention of slums and blight, or meet urgent community needs. Entitlement and nonentitlement communities, as defined by HUD, that are eligible for funds under the CDBG program, are potentially eligible for Section 108 loans. The maximum repayment time for Section 108 loans is twenty years. HUD has the ability to structure Section 108 principal amortizations to match the needs of projects and borrowers. Section 108 financing can be used for environmental protection purposes including construction of or modifications to public facilities such as wastewater treatment plants, improvements to streets and sidewalks that aid in storm water drainage, and redevelopment of abandoned sites that prevents the need to utilize open space for development projects.

**Reference for Further Information:** U.S. Department of Housing and Urban Development Website: <http://www.hud.gov/offices/cpd/communitydevelopment/programs/108/>. See the HUD Community Development Block Grant tools in Guidebook Section 2c.

**Amortization of Pollution Control Facilities**

**Description:** Amortization, similar to depreciation, is a method of recovering the capital costs of intangible assets over a fixed period of time by deducting them or writing them off. Under U.S. Internal Revenue Service (IRS) rules and U.S. federal law, the cost of a certified pollution control facility can be amortized over 60 months. A certified pollution control facility is defined by the IRS as a new identifiable treatment facility used in connection with a plant or other property in operation before 1976 to reduce the waste of resources and to prevent the creation of or reduce pollution and contamination to the water and atmosphere. The pollution control facility must be certified by state and federal certifying authorities. Amortization reduces taxable income for the affected tax years, thereby reducing the real cost of the pollution control facility by the amount that income taxes are reduced. For tax purposes, the distinction is not always made between amortization and depreciation. Still, amortization remains a viable financial accounting concept in its own right.

**Reference for Further Information:** Wikipedia: <http://en.wikipedia.org/wiki/Amortization> & <http://en.wikipedia.org/wiki/Depreciation>. Consult a tax practitioner.  
Internal Revenue Service Website: <http://www.irs.gov/publications/p535/ch08.html#d0e6593>.  
Cornell University Law School Website: [http://www.law.cornell.edu/uscode/html/uscode26/uscode26\\_usc\\_sec\\_26\\_00000169----000-.html](http://www.law.cornell.edu/uscode/html/uscode26/uscode26_usc_sec_26_00000169----000-.html).  
BNET Business Directory Website: <http://dictionary.bnet.com/definition/Amortization.html>.

### **Appropriate Technology**

**Description:** The question of what technology is most appropriate must be made considering the environmental, cultural, and economic situations that the technology is intended for. Through the selection of appropriate technology, total life-cycle costs for that technology can be lowered substantially. Appropriate technology is selected based on realistic appraisals of input requirements and impacts on society and the environment. Basic types of technology that rely on locally available materials, geography, and resources may be most appropriate for certain areas and circumstances. For example, windmills are a less advanced form of technology than solar panels, but in very windy areas with little sunshine they would clearly be a more appropriate and cost effective choice for power generation. Choices among mixes of different technology characteristics work best in some situations. In some cases, organizations provide communities and groups with assistance in finding the appropriate technology. For example, the National Environmental Services Center (NESC) helps communities to determine the appropriate technology to meet their drinking water and wastewater treatment needs. Also, the National Center for Appropriate Technology serves economically disadvantaged people by providing them with information about and access to appropriate technologies.

**Reference for Further Information:**  
National Environmental Services Center Website: <http://www.nsfsc.wvu.edu>.  
National Center for Appropriate Technology Website: [http://www.ncat.org/about\\_history.html](http://www.ncat.org/about_history.html).  
Wikipedia: [http://en.wikipedia.org/wiki/Appropriate\\_technology](http://en.wikipedia.org/wiki/Appropriate_technology).

**Barter**

**Description:** Barter is a type of trade that does not use money or any other medium of exchange, but instead involves the trade of goods and/or services. Barter trade is also called reciprocal trade. The Internal Revenue Service (IRS) defines a barter exchange for tax purposes as “any person or organization with members or clients that contract with each other (or with the barter exchange) to jointly trade or barter property or services.” Barter income is taxable under IRS rules, but the IRS does provide some exceptions to those tax rules, listed on the IRS website. There are a number of organizations involved in promoting barter. The International Reciprocal Trade Association is a nonprofit organization of companies dedicated to promoting just and equitable standards of reciprocal trade and raising the value of reciprocal trade to businesses and communities worldwide. The National Association of Trade Exchanges is an association of independent trade exchange owners who share their experiences and resources. Companies in the environmental goods and services industry, such as companies producing energy efficient appliances and equipment for reducing pollution, could use barter to preserve cash flow and transform surplus inventory into goods and services.

**Reference for Further Information:** International Reciprocal Trade Association Website: <http://www.irta.com/Page.asp?Script=1>. National Association of Trade Exchanges Website: [www.nate.org/](http://www.nate.org/). Wikipedia: <http://en.wikipedia.org/wiki/Barter>. Internal Revenue Service Website: <http://www.irs.gov/businesses/small/article/0,,id=113437,00.html>. Barter- Relevance and Relation to Money Website: <http://www.ex.ac.uk/~RDavies/arian/barter.html>.

### **Fiscal Impact Analysis**

**Description:** Fiscal impact analysis is a tool for identifying public sector costs, including environmental impacts and the potential costs of public services, associated with policies and projects. Local government decision making related to zoning processes, land use planning, and new housing or business development is frequently made with the help of fiscal impact analysis. Fiscal impact analysis considers capital costs, operating and maintenance costs, changes in revenue, impacts on energy requirements, anticipated costs to taxpayers, and potential legal liabilities related to project and policies. Each element may be weighted. Various local governments in the United States use different methods for fiscal impact analysis. For example, some look at projected health and safety effects, community economic impacts and quality-of-life factors related to policies or projects. Interrelationships among projects, including those in neighboring jurisdictions, are sometimes considered. Payback times for loans used to fund projects may also be looked at. Fiscal impact analysis helps policy makers to determine whether the prospective societal benefits of proposed policies and projects outweigh the anticipated costs.

**Reference for Further Information:** Solnit, Albert, *Job of the Practicing Planner*: APA Planners Press, 1988, available at <http://www.planning.org/apastore/Search/Default.aspx?p=1823>. Natural Resources Defense Council Website: <http://www.nrdc.org/cities/smartgrowth/dd/ddinx.asp>. The Web Book of Regional Science: <http://www.rri.wvu.edu/WebBook/Garrett/chaptersix.htm>.

## Full Cost Pricing

**Description:** Full cost pricing is a method of factoring all current, past, and future costs; including operations, maintenance, and capital costs; into the prices for products and services. For example, public and private utilities such as water and wastewater treatment plants could utilize full cost pricing by setting user fees to recover all of the costs associated with maintaining facilities and providing services, including capital, operations, maintenance, debt service, and replacement. Full cost pricing could also be used in some jurisdictions to recover the costs of building and maintaining roads and highways. Rather than using full cost pricing, government entities often rely on tax dollars to partially or fully subsidize the costs of providing public services and facilities. For example, local governments may subsidize user fees for drinking water and wastewater utilities to assist low income households. Private businesses utilize the full cost pricing method much more frequently than government entities. Use of full cost pricing can help facilities and services to be financially self-sustaining. Full cost pricing systems that charge people more when they use more of a resource may encourage consumers to conserve valuable and limited natural resources such as water.

**Reference for Further Information:** U.S. Environmental Protection Agency Website: <http://www.epa.gov/waterinfrastructure/pricing/About.htm> & <http://www.epa.gov/waterinfrastructure/fullcostpricing.html>.  
Victoria Transport Policy Institute Website: <http://www.vtpi.org/tdm/tdm29.htm>.

## Expensing of Assets

**Description:** Section 179 of the United States Internal Revenue Code allows businesses to immediately deduct the costs of certain types of property as expenses on their income taxes, rather than requiring the property to be capitalized and depreciated. This type of tax deduction is called expensing of assets. Under Section 179, businesses are allowed to elect current expense deductions in the year the qualifying property is placed in service, which gives them a more immediate tax benefits than does a depreciation deduction over a specified recovery period. Expensing is a widely and commonly used current-year income tax minimization strategy. The use of expensing increases current year cash profits by decreasing taxable income and consequent federal tax liability. Qualifying property is acquired for use in a trade or business and includes tangible personal property such as machinery and equipment. Assets that are used for environmental protection purposes, such as equipment for delivery of pollution remediation services, and equipment for generating renewable energy, including photovoltaic cells, solar hot water heaters, and windmills, can qualify for expensing of assets.

**Reference for Further Information:** Internal Revenue Service Website: <http://www.irs.gov/publications/p946/index.html>. Consult a tax practitioner.  
Cornell University Law School Website: [http://www.law.cornell.edu/uscode/uscode26/usc\\_sec\\_26\\_00000179---000-.html](http://www.law.cornell.edu/uscode/uscode26/usc_sec_26_00000179---000-.html).  
Wikipedia: [http://en.wikipedia.org/wiki/Section\\_179\\_depreciation\\_deduction](http://en.wikipedia.org/wiki/Section_179_depreciation_deduction).

## Pay-As-You-Go

**Description:** Pay-as-you-go is a system for funding public infrastructure that relies on tax and fee revenues, intergovernmental transfers, and/or trust fund balances rather than the issuance of debt. User fees and earmarked taxes tend to be the revenue foundations of pay-as-you-go systems. Specific percentages of general fund revenues are sometimes committed to pay-as-you-go infrastructure projects for state and local governments. Reserve funds and trust funds are often utilized in pay-as-you-go systems to accrete sufficient cash amounts. The Highway Trust Fund, which provides financing for the national system of interstate and defense highways, is an example of that type of fund. Pay-as-you-go systems are often used to purchase assets such as communications equipment and transportation vehicles. In some jurisdictions, such as Buffalo, New York, pay-as-you-go systems are used to finance the capital costs of water and wastewater treatment systems. The pay-as-you-go approach is feasible for environmental protection projects that have sufficient political support to compete against other budget priorities.

**Reference for Further Information:** U.S. Department of Transportation Federal Highway Administration Website: <http://www.fhwa.dot.gov/> and <http://www.fhwa.dot.gov/infrastructure/byrd.htm>. Northeast Midwest Institute Website: <http://www.nemw.org/HWtrustfund.htm>. City of Buffalo, Minnesota Website: <http://www.ci.buffalo.mn.us/utilities/service/SACReport2004.pdf>. League of Women Voters of California Education Fund Website: <http://ca.lwv.org/lwvc/edfund/elections/2003/id/prop53.html>.

### **Refinancing Loans**

**Description:** Refinancing means applying for a secured loan to pay off an existing loan secured by the same assets. Through refinancing, monthly payments can be lowered on mortgages and other types of loans through a number of different methods. These methods include changing the loan to a lower interest rate, and extending the period of the loan, so as to extend the re-payment over a longer period of time. The most common consumer refinancing is done for home mortgages. Refinancing may be undertaken for the following reasons: 1.) to reduce interest rates on loans, 2.) to pay off other debts, 3.) to reduce periodic payment obligations (sometimes by taking out longer-term loans), 4.) to reduce risk by refinancing from a variable rate to a fixed rate loan, 5.) to liquidate some or all of the equity that has accumulated in real property during the tenure of ownership. Refinancing is done when the economic climate is one of lower interest rates compared to the time when the loan was originated. Most commercial lending institutions refinance loans. The refinancing need not be handled by the original lender. The money saved through refinancing of loans taken out for environmental protection purposes can be invested in additional environmental protection initiatives.

**Reference for Further Information:**  
Wikipedia: [http://en.wikipedia.org/wiki/Mortgage\\_refinance](http://en.wikipedia.org/wiki/Mortgage_refinance).  
MortgageLoan Website: <http://www.mortgageloan.com/refinance-mortgage>.

### **Reforestation Tax Deduction and Amortization**

**Description:** Internal Revenue Service (IRS) rules allow taxpayers in the United States to deduct a limited amount, up to \$10,000 per year, of qualifying reforestation costs for each qualified timber property they own or lease. In addition, taxpayers can elect to amortize over 84 months any reforestation costs not deducted. There is no annual limit on the amount that taxpayers can elect to amortize. Amortization is a method of recovering (deducting) certain capital costs over a fixed period of time. Qualifying expenses for tax deductions and/or amortization are limited to costs which must otherwise be capitalized and included in the adjusted basis of the property, such as costs for site preparation, seeds or seedlings, labor, tools, and depreciation on equipment used in planting. To qualify for tax deductions and/or amortization, a timber property must be located in the United States, and it must consist of at least one acre planted with tree seedlings in the manner normally used in forestation or reforestation for commercial production of qualifying timber products. Tax deductions and amortization can make reforestation investments financially feasible for landowners.

**Reference for Further Information:** Consult a tax practitioner.

Internal Revenue Service Website: <http://www.irs.gov/publications/p225/ch07.html> & <http://www.irs.gov/instructions/it/ar01.html>. Private Landowner Network Website: <http://www.privatelandownernetwork.org/yellowpages/resource.asp?id=6285>.

### **Rehabilitation Tax Credits**

**Description:** Federal tax credits to support private investment in the rehabilitation and reconstruction of historic buildings are authorized by the U.S. Internal Revenue Service (IRS) and U.S. Code, Title 26, Section 47. Generally, the percentage of expenditures that taxpayers are allowed to take as credits are 10% for buildings placed in service before 1936 and 20% for certified historic structures. For qualified rehabilitation costs paid or incurred after August 27, 2005, and before January 1, 2009, on buildings located in the Gulf Opportunity zone, the rehabilitation credit is increased from 10% to 13% for pre-1936 buildings, and is increased from 20% to 26% for certified historic structures. The term “certified historic structure” is defined as any building (and its structural components) which is listed in the National Register or is located in a registered historic district and is certified by the Secretary of the Interior as containing criteria which will substantially achieve the purpose of preserving and rehabilitating buildings of historic significance to the district. Renovation, restoration, and reconstruction activities qualify as rehabilitation under IRS rules. Enlargement and new construction do not qualify. These tax credits help to make rehabilitation and reconstruction of existing buildings more affordable, helping to prevent the need to utilize open space to build new buildings.

**Reference for Further Information:** Internal Revenue Service Website:

<http://www.irs.gov/businesses/small/industries/article/0,,id=97599,00.html>.

Cornell University Law School Website:

[http://straylight.law.cornell.edu/uscode/html/uscode26/usc\\_sec\\_26\\_00000047----000-.html](http://straylight.law.cornell.edu/uscode/html/uscode26/usc_sec_26_00000047----000-.html).

### **Risk Management**

**Description:** Risk management involving the creation of pre-loss plans can be part of strategic planning that reduces costs and financial liabilities for organizations in the public and private sectors. Pre-loss plans are designed to minimize the adverse impacts of risks on the resources, earnings, cash flows, profitability, and credit ratings of organizations. These plans are most effective when they take into consideration public interest, public safety, and environmental protection. Financing and preparation techniques designed to help mitigate risks and prepare organizations for potential risks are included in pre-loss plans. In many cases, pre-loss plans involve risk transfer via the purchase of environmental insurance. Environmental insurance is a tool for managing a party's environmental liability by transferring some of the associated financial risk to another party under the limited provisions of the policy. Businesses in the environmental goods and services industry use risk management and pre-loss plans to help mitigate the risks associated with activities such as the cleanup of contaminated properties. The American Risk and Insurance Association is an organization devoted to the study and promotion of risk management and insurance.

**Reference for Further Information:** American Risk and Insurance Association Website: <http://www.aria.org/>. Wikipedia: [http://en.wikipedia.org/wiki/Risk\\_management](http://en.wikipedia.org/wiki/Risk_management). See "Environmental Insurance" and "Environmental Risk Management in the Real Estate Industry" in Section 9 of this Guidebook.

## Discounting

**Description:** In finance and economics, discounting is the process of finding the present value, also called the discounted value, that a given amount of cash will have at a future date. The present value of a cash flow is determined through the reduction of its value by an assigned discount rate, expressed as a percentage, for each unit of time between when the cash flow is to be valued and the present time. In most cases the discount rate is expressed as an annual rate. In financial accounting, discounting is the essence of most capital investment appraisal, comparing present cash flows with expected future cash flows. Discounting of an environmental protection measure is done by assigning a cash value and a discount rate to that environmental protection measure. For example, a cash value and a 10% annual discount rate could be used to estimate the present value that environmental economic benefits associated with salmon habitat restoration would have at a future date. The National Oceanic and Atmospheric Administration (NOAA) does discounting calculations of that nature to weigh the benefits and costs of coastal restoration projects and various environmental management programs. Discounting can provide a basis for making choices between investments in different environmental protection initiatives.

**Reference for Further Information:** Wikipedia: <http://en.wikipedia.org/wiki/Discounting>, [http://en.wikipedia.org/wiki/Discount\\_rate](http://en.wikipedia.org/wiki/Discount_rate) and [http://en.wikipedia.org/wiki/Present\\_value](http://en.wikipedia.org/wiki/Present_value). National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center Website: <http://www.csc.noaa.gov/coastal/economics/discounting.htm>.

## Value Engineering

**Description:** Value engineering, also called value methodology, is defined in U.S. Public Law 104-106 as an analysis of the functions of a program, project, system, product, item of equipment, building, facility, service, or supply of an executive agency, performed by qualified agency or contractor personnel, directed at improving performance, reliability, quality, safety, and life cycle costs. Public Law 104-106 states that each executive agency shall establish and maintain cost-effective value engineering procedures and processes. The U.S. Environmental Protection Agency (EPA) defines value engineering as a specialized cost-control technique that uses a systematic and creative approach to identify and reduce unjustifiably high costs in a project without sacrificing the reliability or efficiency of the project. EPA is required to apply value engineering during Superfund Fund-lead remedial design and remedial action projects. Value engineering can be applied to various types of environmental protection projects in the public and private sectors, such as pollution prevention and cleanup projects. SAVE International is a society devoted to the advancement and promotion of value engineering.

**Reference for Further Information:** U.S. Environmental Protection Agency Website: <http://www.epa.gov/superfund/cleanup/rdra.htm>, see “value engineering” at the end of the list of topics. Text of Public Law 104-106: [http://oecm.energy.gov/Portals/2/PL104\\_106.pdf](http://oecm.energy.gov/Portals/2/PL104_106.pdf). Wikipedia: [http://en.wikipedia.org/wiki/Value\\_engineering](http://en.wikipedia.org/wiki/Value_engineering). SAVE International Website: <http://www.value-eng.org/>.

### **Environmental Due Diligence**

**Description:** Environmental due diligence is an investigation process carried out to ensure that a property is free of environmental contamination from current or past practices. One of the most important requirements for real estate transactions financed by institutional lenders is that environmental due diligence be done in a way that satisfies statutory requirements for conducting all appropriate inquiries as defined by the U.S. Environmental Protection Agency (EPA). The EPA published the All Appropriate Inquiries Final Rule (Final Rule) in the Federal Register on November 1, 2005. The Final Rule sets federal standards for the conduct of all appropriate inquiries. Starting on November 1, 2006, parties must comply with the requirements of the Final Rule, or with the standards of the Phase I Environmental Site Assessment Process, to satisfy the statutory requirements for conducting all appropriate inquiries. Adherence to the standards of the Final Rule or the Phase I Environmental Site Assessment Process is required for protecting property owners from liability under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

**Reference for Further Information:** Bureau of National Affairs Website: <http://www.bna.com/products/ens/eddg.htm>. Environmental Data Resources Website: [www.edrnet.com/reports/whitepapers/LendingtoSmall.pdf](http://www.edrnet.com/reports/whitepapers/LendingtoSmall.pdf). Lawrence, Gary M., *Due Diligence in Business Transactions*, Law Journal Press, 1994; available at [http://www.lawcatalog.com/product\\_detail.cfm?productID=1049&return=listview&setlist=0&](http://www.lawcatalog.com/product_detail.cfm?productID=1049&return=listview&setlist=0&). SCS Engineers Website: <http://www.scsengineers.com/duedil.html>.

### **Financial Due Diligence**

**Description:** Financial due diligence is a series of tests that must be passed for a financing deal to qualify for an investment. The financial due diligence process is initiated when a business plan is sent to the potential investor, who applies preset criteria to screen out unacceptable deals. This screening includes a quantitative and qualitative analysis of how the business has performed financially to get a sense of earnings on a normalized basis. An identification and analysis of the assets and liabilities to be acquired is also included as part of the screening. In addition, an investigation is made into whether federal and state taxes have been filed appropriately by the seller. Financial due diligence is used by institutional investors and lenders considering commitment of funds to a venture.

**Reference for Further Information:** Lawrence, Gary M., *Due Diligence in Business Transactions*, Law Journal Press, 1994; available at [http://www.lawcatalog.com/product\\_detail.cfm?productID=1049&return=listview&setlist=0&](http://www.lawcatalog.com/product_detail.cfm?productID=1049&return=listview&setlist=0&). Financial Evaluations & Examinations, Inc. Website: <http://www.feeinc.com/burke.html>. See “Business Plans” & “Venture Capital” in Guidebook Section 10a. Plante & Moran, PLLC Website: <http://www.plantemoran.com/Services/Consulting/StrategyGlobalServices/Resources/Articles/Due+Diligence.htm>.

## Benchmarking

**Description:** Benchmarking is a management system in which organizations in the public and private sectors evaluate their processes and procedures in relation to best practices, develop plans on how to adopt the best practices, and establish measures of success called benchmarks. Most organizations find that benchmarking more than pays for itself. *Oregon Shines* is an example of a state run benchmarking system that is still in progress. It is a 20-year vision developed in 1989 to monitor the state’s progress in emerging from an economic recession and improving public health and quality of life in the state. Connecticut, Florida, Maine, Minnesota, North Carolina, and Vermont have performance-based benchmarking systems similar to the Oregon model. An example of an environmental protection related benchmarking initiative is the survey that is being developed by the Book Industry Study Group (BISG) and the Green Press Initiative (GPI). The BISG and the GPI are working together, with support from industry sponsors, to produce a benchmarking survey that will establish a baseline for measuring the progress of the U.S. book industry in environmental protection related areas including paper recycling and climate impacts.

**Reference for Further Information:** Wikipedia: <http://en.wikipedia.org/wiki/Benchmarking> and <http://en.wikipedia.org/wiki/Benchmark>. Book Industry Study Group Website: [http://www.bisg.org/publications/environmental\\_benchmarking.html](http://www.bisg.org/publications/environmental_benchmarking.html). Leichter, Howard M.; and Tryens, Jeffrey, *Achieving Better Health Outcomes: the Oregon Benchmark Experience*, Milbank Memorial Fund, New York, 2002, available at: <http://www.milbank.org/reports/OregonProgres/020909Oregon.html>.

## Deduction of Agricultural Conservation Expenses

**Description:** U.S. Internal Revenue Service rules allow landowners and their tenants to deduct qualifying soil and water conservation expenses and erosion control expenses from their gross income for federal income tax purposes. These expenses must be incurred to protect land that the landowners or tenants are using or have used in the past for farming. The tax deduction cannot amount to more than 25% of the taxpayer's gross income from farming. Expenses can be deducted only if they are consistent with a plan approved by the U.S. Department of Agriculture's Natural Resources Conservation Service, or a soil conservation plan of a comparable state agency. Expenses for leveling, conditioning, grading, terracing, contour furrowing, restoration of soil fertility, and related treatment or movement of land are eligible. In addition, expenses for the construction, control, and protection of diversion channels, drainage ditches, irrigation ditches, earthen dams, watercourses, outlets, and ponds are eligible. Expenses for the planting of windbreaks and eradication of brush may also be deducted. To get the full deduction to which they are entitled, taxpayers must maintain records that clearly distinguish between their customary farm business expenses and their soil and water conservation expenses.

**Reference for Further Information:** Consult a tax practitioner.

Internal Revenue Service Website: <http://www.irs.gov/publications/p225/ch05.html> & <http://www.irs.gov/businesses/small/industries/article/0,,id=99004,00.html>. U.S. Department of Agriculture Natural Resources Conservation Service Website: <http://www.nrcs.usda.gov/>.

### **Comparative Risk Ranking**

**Description:** Comparative risk ranking, also called comparative risk assessment and comparative risk analysis, is a procedure for prioritizing problems based on their threat to public health and the environment. The process of comparative risk ranking involves a high level of citizen input. Comparative risk ranking helps communities and organizations to allocate limited resources to the most serious environmental and public health problems first. For example, the Lower Columbia River Estuary Partnership integrated a comparative risk assessment into its management plan development to help assess potential actions. The Partnership's comparative risk assessment asked citizens and technical experts to rank a list of problems based on their threat to public health, ecological health, and quality of life. Another example of comparative risk ranking is the Ohio Comparative Risk Project. This was a citizen-based planning project that evaluated problems in Ohio based on scientific evidence and public values. The information collected in the study was then used to develop an environmental priority list and strategies for policymakers and citizens to use in reducing risk, made public in 2001.

**Reference for Further Information:** Lower Columbia River Estuary Partnership Website: [http://www.lcrep.org/lib\\_risk\\_ranking.htm](http://www.lcrep.org/lib_risk_ranking.htm).

Scorecard Website: [http://www.scorecard.org/comp-risk/def/comprisk\\_explanation.html](http://www.scorecard.org/comp-risk/def/comprisk_explanation.html).

U.S. Environmental Protection Agency Website:

[http://www.epa.state.oh.us/oeef/ohio\\_comparative\\_risk\\_project.html](http://www.epa.state.oh.us/oeef/ohio_comparative_risk_project.html).

Franklin Pierce Law Center Website: <http://www.piercelaw.edu/risk/vol6/fall/kadvany.htm>.

### **Cost-Effectiveness Analysis**

**Description:** Cost-effectiveness analysis (CEA) is a form of economic analysis that compares the relative expenditures, called costs, to the outcomes, called effects, of two or more courses of action. For example, CEA may be done to compare the costs and effects of two different proposed regulations for improving air quality. CEA can also be used to measure the ratio of the costs of a single intervention, such as improvements to drinking water quality, to a measure of the intervention's effects, such as statistics on public health benefits in the community drinking the water. Cost-effectiveness analysis is done by federal departments and agencies, including the U.S. Environmental Protection Agency, when performing Regulatory Impact Analyses. Many state agencies and private businesses also perform CEA.

**Reference for Further Information:** U.S. Environmental Protection Agency (EPA), "Guidelines for Preparing Economic Analysis," 2000, EPA # 240-R-00-003, available at <http://yosemite1.epa.gov/ee/epa/erm.nsf/vwSER/DEC917DAEB820A25852569C40078105B?OpenDocument>. Wikipedia: [http://en.wikipedia.org/wiki/Cost\\_effectiveness\\_analysis](http://en.wikipedia.org/wiki/Cost_effectiveness_analysis). AEI-Brookings Joint Center Website: <http://www.aei-brookings.org/publications/index.php?tab=topics&topicid=56>. Environmental Damage Valuation and Cost Benefit Links: <http://www.costbenefitanalysis.org/tenbestedvcbnlinks.htm>. Environmental Valuation & Cost Benefit News: <http://www.envirovaluation.org/>.

### **Financial Capability Analysis**

**Description:** Financial capability analysis, also called financial capability assessment, is a method used by public and private entities to determine whether they have the ability to pay for capital investments and equipment, and to assess the economic impacts of proposed projects on communities. The U.S. Environmental Protection Agency recommends that communities carry out financial capability analysis, using indicators including bond ratings and unemployment rates, to determine the affordability of infrastructure projects. Computer software, such as Boise State University Environmental Finance Center's Plan2Fund and CAPFinance software programs, is sometimes used for financial capability analysis.

**Reference for Further Information:** Financial Capability Guidebook, March, 1984, EPA #832B84104, available at <http://yosemite.epa.gov/water/owrccatalog.nsf/>, search the title index. U.S. Environmental Protection Agency Website: <http://www.epa.gov/npdes/pubs/csofc.pdf>. See "Boise State University Environmental Finance Center: Plan2Fund" and "Boise State University Environmental Finance Center: CAP Finance" in Section 5 of this Guidebook. Boise State University Environmental Finance Center Website: [http://sspa.boisestate.edu/efc/Tools\\_Services/Plan2Fund/plan2fund.htm](http://sspa.boisestate.edu/efc/Tools_Services/Plan2Fund/plan2fund.htm) & [http://sspa.boisestate.edu/efc/Tools\\_Services/CAPFinance.htm](http://sspa.boisestate.edu/efc/Tools_Services/CAPFinance.htm).

### **Cost-Benefit Analysis**

**Description:** Cost-benefit analysis is a term for a conceptual framework encompassing a variety of techniques for quantifying and comparing the incremental and total costs, risks, and benefits of legislation, regulations, and other actions. The use of cost-benefit analysis is intended to help produce the best decisions by comparing the economic efficiency of various proposed policies and approaches. Cost-benefit analysis has been used for many years by federal, state, and local governments, and by the private sector, as a tool to aid in important decision making on a wide variety of topics, including environmental protection related matters. The United States government has performed cost-benefit analysis as part of its economic analysis of regulatory actions for many years, following a number of statutory and executive order requirements including Executive Order 12866, titled *Regulatory Planning and Review*. Executive Order 12866 requires analysis of the benefits and costs of all significant regulatory actions carried out by the U.S. government and its agencies and departments, including the Environmental Protection Agency and other U.S. government entities working to protect the environment.

**Reference for Further Information:** U.S. Environmental Protection Agency Website:

<http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html>.

See the January 11, 1996 Office of Management and Budget policy memorandum, *Economic Analysis of Federal Regulations Under Executive Order 12866*, available at

<http://www.whitehouse.gov/omb/inforeg/riaguide.html>.

Wikipedia: [http://en.wikipedia.org/wiki/Cost-benefit\\_analysis](http://en.wikipedia.org/wiki/Cost-benefit_analysis).

Mind Tools Website: [http://www.mindtools.com/pages/article/newTED\\_08.htm](http://www.mindtools.com/pages/article/newTED_08.htm).

## Capital Planning and Budgeting

**Description:** Capital planning is a set of techniques for considering the long-term needs for capital facilities and funding options for meeting those needs. The goal of capital planning is to make the best use of available funds to achieve strategic goals and objectives. Capital budgeting, which is done alongside capital planning, is the total process of generating, evaluating, selecting, and following up on capital expenditures. Capital planning and budgeting are done in the public and private sectors. The Commission to Study Capital Budgeting released a report in 1999 with a series of recommendations to improve the federal budget process through prioritizing, making timely decisions, reporting on those decisions, and evaluating the decisions to help with future decision making. The commission's recommendations could help organizations in the public and private sectors to carry out their capital planning and budgeting more effectively and use their money wisely for environmental protection initiatives.

**Reference for Further Information:** The President's Commission to Study Capital Budgeting Website: <http://clinton3.nara.gov/pcscb/index.html>.

Wikipedia: [http://en.wikipedia.org/wiki/Capital\\_budgeting](http://en.wikipedia.org/wiki/Capital_budgeting).

University of Wisconsin System Website: <http://www.uwsa.edu/capbud/>.

U.S. Department of the Interior Website: <http://www.doi.gov/ocio/cp/index.html>.

FEA DRM Registry Website:

[http://colab.cim3.net/file/work/drm/schema/examples/IRM\\_COI\\_Demo/818.htm](http://colab.cim3.net/file/work/drm/schema/examples/IRM_COI_Demo/818.htm).

## Employee Stock Ownership Plans

**Description:** An employee stock ownership plan (ESOP) is a type of defined contribution pension plan used in the United States that buys and holds company stock, investing primarily in the stock of the employer firm. ESOPs are required to adhere to the standards of the Employee Retirement Income Security Act of 1974 (ERISA), which is a U.S. federal law that sets minimum standards for most voluntarily established pension and health plans in private industry. ESOPs can be funded through tax deductible corporate contributions. Sellers to an ESOP in a closely held company can defer taxation on the proceeds by reinvesting in other securities. Employees do not pay taxes on the contributions to ESOPs until they receive a distribution from the plan when they leave the company. There are over 11,500 ESOPs in the U.S. covering 11 million employees, almost all in closely held companies. Employee owned corporations, which are defined as corporations owned in whole or in part by their employees, are often created through ESOPs. Companies in the Environmental Goods and Services industry, such as wind power generating companies and companies producing pollution abatement equipment, can use ESOPs to increase their profits and save on taxes.

**Reference for Further Information:** The National Center for Employee Ownership Website: <http://www.nceo.org/>. For tax rules, see the Internal Revenue Service Website: [www.irs.ustreas.gov/](http://www.irs.ustreas.gov/). Wikipedia: [http://en.wikipedia.org/wiki/Employee-owned\\_corporation](http://en.wikipedia.org/wiki/Employee-owned_corporation). About.com: [http://retireplan.about.com/cs/retirement/a/aa\\_plan\\_a6.htm](http://retireplan.about.com/cs/retirement/a/aa_plan_a6.htm). U.S. Department of Labor Website: <http://www.dol.gov/dol/topic/health-plans/erisa.htm>.

### **Life Cycle Assessment and Design**

**Description:** Life cycle assessment is defined by the U.S. Environmental Protection Agency as a “cradle to grave” approach for assessing industrial systems and products. “Cradle-to-grave” begins with the gathering of raw materials from the earth to create the system or product and ends at the point when all materials are returned to the earth. Life cycle assessment evaluates all stages of a product’s life cycle from the perspective that they are interdependent, meaning that one operation leads to the next. By examining the impacts of a product or system throughout its life cycle, life cycle assessment provides a comprehensive view of the environmental impacts of the product or system and a more accurate picture of the true environmental tradeoffs in product and system selection. Life cycle assessments can help decision makers to select the products or processes that have the least impacts on the environment. Through the use of information collected in life cycle assessments, products and systems can be designed to reduce their environmental impacts throughout their life cycles. For example, measures can be taken to reduce the pollution created in the manufacture of products, the energy used through the manufacture and use of products, and the waste generated when the products are disposed of.

**Reference for Further Information:** U.S. Environmental Protection Agency Website: <http://www.epa.gov/ORD/NRMRL/lcaccess/>. Scientific Applications International Corporation (SAIC), *Life Cycle Assessment: Principles and Practice*, EPA/600/R-06/060, May 2006, available at [Http://www.epa.gov/ORD/NRMRL/lcaccess/pdfs/600r06060.pdf](http://www.epa.gov/ORD/NRMRL/lcaccess/pdfs/600r06060.pdf).

